CHAPTER

3

STORM WATER POLICIES

3.1 General Policies for Storm Water Design

The following general policies shall apply to all storm water management design calculations:

- Design computations shall be performed in accordance with the calculation guidance provided in this Manual, or other criteria that the local jurisdiction establishes based on scientific and engineering information.
- Storm water runoff resulting from developed conditions on a site must be routed at appropriately small time intervals through water quality and quantity control facilities using either hand calculations or computer software/models that are approved by the City of Wichita and Sedgwick County. Acceptable computer software/models are presented in Volume 2 of this Manual.
- All calculations utilized in the design of storm water control facilities must be prepared by an engineer that is proficient in the field of hydrology and hydraulics and licensed to practice in the State of Kansas.

3.2 Water Quality Control using Structural Storm Water Management Facilities

Storm water management regulations for the City of Wichita and for Sedgwick County require that storm water runoff discharging from new development or redevelopment be treated to reduce or eliminate pollutants prior to discharge from the site, in accordance with the treatment standard defined in this Storm Water Manual (the Manual). The Water Quality Treatment Standard and associated policies are presented below. Policies that are specific to design calculations for different storm water management facilities are included in Volume 2 of this Manual, where facility design specifications are presented.

- Water Quality Treatment Standard: Water quality treatment facilities shall be designed to remove, at a minimum, 80% of the average annual total suspended solids (TSS) load (after-development) from the storm water volume required for water quality treatment, henceforth called the "water quality protection volume" (WQ_v). This standard is also referred to in this Manual as the "80% TSS removal standard".
- The 80% TSS removal standard shall be applied to the 85^{th} percentile storm event. For the City of Wichita and Sedgwick County, the 85^{th} percentile storm event is defined as 1.2 inches of rainfall.
- The WQ_v and % TSS removal shall be calculated for the development or redevelopment in accordance with the policies and calculation guidance provided in this manual. In order to

comply with the 80% TSS removal standard, the result of the % TSS removal calculations for the entire development or redevelopment must be no less than 80%.

- It is presumed that a storm water management facility (or system of facilities) complies with the Water Quality Minimum Treatment Standard if the structural water quality control facilities are selected, designed, constructed and maintained in accordance with the design criteria specified in this manual. Only those structural facilities that are included in this manual are permitted for use as a water quality treatment facility. Other facilities are prohibited, unless approved by the local jurisdiction. The structural facilities (and variations thereof as described in Volume 2 Chapter 3) that are acceptable for use in the City of Wichita and Sedgwick County to attain the Water Quality Minimum Treatment Standard are presented in Table 3-1.

Table 3-1 TSS Removal % for Structural Facilities

Structural Facility	TSS Removal %
Storm Water Pond	80
Dry Extended Detention Pond	60
Enhanced Swale	90
Grass Channel	30
Infiltration Trench	90
Soakage Trench	90
Vegetative Filter Strip	50
Surface Sand Filter	80
Organic Filter	80
Bioretention Area	85
Storm Water Wetland	75
Proprietary Manufactured Device	device-specific
Gravity Oil/Water Separator	device-specific
Alum Treatment	system-specific
Green Roof	installation-specific

- Table 3-1 also presents the % TSS removal value that is assigned to each structural facility type. Only this value shall be used to calculate the total weighted % TSS removal for the development site.

3.2.1 Water Quality Treatment Controls for Special Circumstances

The local jurisdiction may require additional water quality treatment criteria or controls to conform to State and/or Federal regulatory requirements, and/or to address watershed or site-specific water quality requirements, or on land uses that have the potential to discharge pollutants in higher amounts or that would not be adequately treated using the structural facilities identified in this manual. For example, additional treatment criteria may be required if the new development or redevelopment will have a land use or on-site activities may generate highly polluted runoff, with concentrations of pollutants in excess of those typically found in storm water. Examples of such land uses might include operations producing concrete or

asphalt, auto repair shops, auto supply shops, large commercial parking areas, or restaurants. Examples of additional controls could include installation of specialized structural facilities, such as oil/water separators for petroleum based pollutants, or the implementation of pollution prevention practices, such as employee training programs on chemical handling/application. Both types of additional controls are the responsibility of the property owner and/or business/activity operator.

General policies for structural facilities and pollution prevention activities at land uses that are often identified as having a higher than normal pollutant potential are presented in the following paragraphs.

Gas stations, vehicle maintenance, washing or storage facilities. Gas stations, vehicle storage and/or maintenance facilities shall address the potential for pollutant discharges from petroleum-based products, oils and other fluids in the following manner:

- Oil/water separators or other separation or absorbent devices that target removal of gasoline, petroleum based products, oils and other fluids commonly associated with motor vehicles (e.g., anti-freeze) shall be installed to reduce or eliminate the potential for such pollutants to be discharged into storm water runoff.
- Gas pump areas and vehicle maintenance areas shall be covered and not exposed to rainfall and storm water runoff. Floor drains in these areas shall not be connected to the storm water system. Wash water from these areas should be prevented from discharging to the storm water drainage system.
- Discharges of wash water resulting from the hosing or cleaning of vehicles, equipment and/or facilities is considered an illegal non-stormwater discharge. Therefore, wash water must be prevented from entering the stormwater system. These activities could include blocking the stormwater system or diverting the wash water into a pre-treatment measure and then into the sanitary sewer system. Floor drains in vehicle wash areas shall not be connected to the storm water system. It is preferred that these areas be covered and therefore not exposed to rainfall and storm water runoff.
- Pollution prevention activities for vehicle maintenance, washing, or storage land uses shall be employed as appropriate, focusing on:
    - spill prevention and cleanup;
    - oil and other fluid and material recycling;
    - staff education on proper pollution prevention techniques; and,
    - customer education about repair and maintenance activities that are or are not acceptable on the premises.
- For businesses where vehicles will be stored, pollution prevention activities must also include routine inspection of the vehicles for leaks or discharges. Drip pans must be used to capture leaks and discharges until the vehicle can be maintained or fluids should be drained completely from vehicles that will remain unused.

Recycling and salvage yard facilities. Where the land use is a business that recycles or salvages vehicles or other equipment, the pollution prevention practices for that site must include draining the equipment of all fluids before storage. If the storage area is uncovered, pre-treatment controls are required to treat additional pollutants that could result from the storage or deterioration of the equipment or vehicles before the runoff discharges to structural storm water control facilities.

Restaurants, grocery stores, and other food service facilities. Grease, trash and organic pollutants are pollutants that are typically encountered around restaurants, grocery stores, and other food service facilities. Pre-treatment to remove such pollutants prior to discharging to structural storm water facilities is required, in order to prevent clogging of downstream BMPs and the stormwater system. Grease traps are required for all sinks and floor drains. Dumpsters shall be covered at all times, and leakage from dumpsters shall not be allowed to discharge to the storm water system. As well, wash water from equipment and/or facility cleaning activities must either be discharged to the sanitary sewer or be pre-treated prior to discharging to a storm water facility. Litter and other wastes shall be picked-up on a regular basis to prevent them from entering the storm water system. Parking lots shall be swept/cleaned on a regular basis to remove gross solids. Wastes gathered during litter collection and parking lot cleaning activities shall be disposed of properly.

Facilities that temporarily or permanently house animals outside (non-agricultural). Animal housing facilities, such as veterinary clinics, boarding facilities, recreational (i.e., non-agricultural) livestock stables, and animal shelters have the potential to deliver higher than normal bacterial loadings to the stormwater system. High counts of bacteria in streams and rivers can cause water quality impairments, but can also cause illnesses in people. Pollution prevention practices for these types of facilities shall include pet waste management practices, such as collecting and properly disposing of pet waste at landfills or wastewater treatment facilities. Soiled animal bedding shall be removed and properly disposed. Wood shavings or chips shall not be allowed to migrate into the stormwater system.

3.3 Water Quality Control using Non-Structural Preferred Site Design Practices

Non-structural storm water control practices (also called Preferred Site Design practices) are increasingly recognized as a useful tool in site design because they result in the generation of less storm water runoff from a development site than what would be generated in a more conventional site design. As compared to conventional site designs, a Preferred Site Design approach attempts to adapt a development design to the existing site conditions, and therefore preserve the topography, vegetative cover and hydrologic and environmental features of a site to the maximum extent practicable. This results in less clearing and grading, less use of impervious areas, and therefore less storm water runoff and dependency on storm water infrastructure. Relevant to the storm water management requirements contained in local storm water management regulations and in this Manual, the use of Preferred Site Design practices in a site design can have the effect of reducing the runoff volumes and peak flows, and therefore the size of the storm water management facilities and conveyance appurtenances that are needed to control storm water on the site. Preferred Site Design practices are discussed in detail in Chapter 2 of Volume 2.

The use of Preferred Site Design practices are included in the Storm Water Manual as an option, not as a requirement. As an incentive, a set of WQ_v "reductions" has been developed to quantitatively recognize the benefits of certain practices to further reduce the volume of storm water that must be treated for pollutants, and therefore reduce the size of the structural storm water facility needed for water quality treatment.

General policies pertaining to WQ_v reductions are as follows:

- The amount of WQ_v reduction obtained for a site will be determined in accordance with the reduction guidance presented in Volume 2 of this Manual.
- WQ_v reductions can only be claimed if the area or practices for which the reduction is requested conforms to all of the required minimum design criteria and conditions stated in Volume 2 of this Manual. Full or partial reductions will not be given to areas or practices that do not conform to all of the criteria and conditions. The intent of this policy is to avoid situations that could lead to a reduction being granted without the corresponding decrease in pollution attributable to an effective Preferred Site Design practice.
- WQ_v reductions cannot be claimed twice for an identical area of the site (e.g., a reduction for stream buffers cannot be claimed if that area has already received a reduction for disconnecting impervious areas).
- General Preferred Site Design practices and techniques performed without regard to the criteria and conditions stated in this Manual will not be awarded WQ_v reductions. However, these practices reduce the overall impervious and disturbed area of a development. This land use change reduces the total amount of storm water runoff generated by a site, and thus the required WQ_v.

3.4 Ground Water Protection

It is the intent of the City of Wichita and Sedgwick County to minimize the risk of contaminating groundwater by storm water runoff discharged from new developments and redevelopments. The design guidance in Volume 2 of this manual requires minimum separation between the bottom of certain storm water management facilities (wet ponds, infiltration trenches, soakage trenches, sand filters, organic filters, bioretention areas and wetlands) and the historical high groundwater table. These measures are intended to minimize the risk of contaminating groundwater with storm water runoff. However, in all cases, more restrictive regulations invoked by local, State or Federal authorities, or adopted local, State or regional groundwater programs shall apply.

For areas where the historically high groundwater table is within 5' of the bottom of the storm water facility, storm water runoff from a new development or redevelopment may be discharged into one of the facilities listed above only after the runoff has met the Water Quality Treatment Standard, as defined in the local storm water management regulations and in this manual. This separation distance may be reduced to 2' if additional measures such as lining or underdrains are installed per the guidance found in Volume 2 of this manual. The local jurisdiction may waive this requirement if engineering studies determine that installing the

required water quality treatment practices are unnecessary to protect groundwater quality, human health and the environment.

Any discharge of storm water runoff directly to groundwater must meet all applicable local, State and Federal requirements, permits, plans and programs. The person(s) responsible for the new development or redevelopment are also responsible for all local, State and Federal permits that may be applicable to the site.

3.5 Downstream Channel Erosion Protection

It is the policy of the local jurisdiction to minimize the effects of development or redevelopment on long-term downstream channel erosion. The local storm water management regulations include requirements for the protection of channels and streams from increased long-term erosion due to development or redevelopment. The specific methods for analyzing and achieving this requirement are contained in Volume 2 of the Manual. There are no additional policies associated with downstream channel erosion protection in this volume.

3.6 Peak Discharge Control

Local storm water management regulations include requirements for the control of storm water runoff peak discharges at the outlet(s) of the development site, as well as downstream of the development site. The regulations also include criteria upon which peak discharge control requirements may be waived by the local jurisdiction. Policies associated with the peak discharge control standard are listed below.

- Peak discharge control evaluations showing full routing calculations and supporting documentation shall be submitted with the drainage plan, in the manner described in Volume 2 of this Manual.
- For redevelopment sites, peak flow controls shall be sized using the existing land use as the baseline condition, not the land use that existed prior to the original development of the site.
- Peak discharge analyses should be performed after any Preferred Site Design practices have been included in the design. While there are no explicit reductions for peak discharge controls, the use of Preferred Site Design practices will inherently reduce runoff volumes and potentially reduce post-development peak discharges, both on-site and downstream of the site.

3.7 Storm Water Conveyance Design

It is the intent of the local jurisdiction to ensure that storm water control infrastructure is capable of safely and efficiently conveying the applicable design flows; that the infrastructure be durable and maintainable; and that structures are protected against flood damage even when the infrastructure experiences runoff events greater than the design flows, up to the 100-year flood occurrence. The specific requirements are prescribed in local storm water management regulations, and the design procedures for achieving those requirements are

provided in Volume 2 of the Manual. There are no additional policies associated with downstream channel erosion protection in this volume.

3.8 Floodplain Management

The local jurisdiction's primary floodplain management requirements are contained in their floodplain management and/or flood damage prevention regulations (Wichita Code of Ordinances # 27.06 and Sedgwick County Code Chapter 13). However, these regulations address only those requirements for areas that are designated by the Federal Emergency Management Agency (FEMA) as special flood hazard areas and are included on the Wichita or Sedgwick County Flood Insurance Rate Maps (FIRMs). Additional floodplain management requirements are contained in local storm water management regulations, which address both special flood hazard areas and floodplains and flood-prone areas that are not included on FIRMs.

Specific policies to support local jurisdiction floodplain management requirements are as follows.

- Watershed analysis and planning efforts have indicated that the flood potential in specific drainage basins within each jurisdiction are especially sensitive to changes in floodplain storage volumes. In short, a loss in floodplain storage volume in such basins may significantly raise the flood potential for habitable structures in the basin. In an effort to eliminate the loss of floodplain storage in volume sensitive basins, the local jurisdictions have included a requirement in their storm water management regulations and/or floodplain management regulations to provide compensatory storage when development or other encroachments occur in the floodplains of volume sensitive basins. Policies associated with this requirement are as follows.

  Volume sensitive basins shall be defined by the local jurisdiction. Maps indicating volume sensitive basins in the City of Wichita may be obtained from **<<<tobedetermined>>>.** Maps indicating volume sensitive basins in Sedgwick County may be obtained from **<<<tobedetermined>>>.** The location and magnitude of compensatory excavations shall be provided with the storm water design information that is incorporated into the construction plan, and must be approved by the local jurisdiction prior to excavation activities.

- The property owner performing compensatory excavations is responsible for obtaining all applicable local, State and Federal permits.

3.9 Residential 1 & 2 Family Exterior Storm Drain Piping/Lines

The purpose of this policy is to outline minimum installation guidelines and related local jurisdiction permitting requirements for both aboveground and underground storm water or sump pump piping/discharge for 1 and 2 family residential structures. This policy is developed with respect to the requirements set forth in City of Wichita Code Title 10 (Streets and Sidewalks), Title 16 (Sewers, Sewage Disposal and Drains), and Title 18 (Building Code).

This policy affects 1 and 2 family construction only. The procedures for commercial exterior storm drain piping/lines (or any construction other than 1 and 2 family residential) are not affected by this policy.

The policy is as follows:

1. Local jurisdiction permits are NOT required for the following outdoor storm water or **uncontaminated** sump pump piping/discharges for 1 & 2 family residential construction or use:

    - Any drain pipe/discharge that is not placed or located within seven and a half (7.5) feet of a public sidewalk;
    - If no public sidewalk exists, any drain pipe/discharge that does not abut or lie within a public street right-of-way, and which is not closer than ten (10) feet to the back of any public street curb;
    - Any drain pipe/discharge that is not placed or located within five (5) feet of a rear private property line;
    - Any drain pipe/discharge that is not placed or located within two (2) feet of a side private property line and does not project discharged water across a property line;
    - Any drain pipe/discharge that is not connected to a public storm sewer line, inlet or box;
    - Any drain pipe/discharge that is not placed or located in a **publicly maintained** drainage way, ditch or culvert. **NOTE:** the installation of private storm drainage lines within a public easement (except to use the utility) is discouraged so as not to encumber the easement. Installation of such private drain lines, sprinkler heads, fences, flower beds, rock gardens, etc., within a public easement is subject to removal at the property owner's expense in the event a public utility repair or replacement is necessary.

2. Local jurisdiction permits shall be required for the following:

    - If a storm water drain pipe/discharge extends through a public street curb (sump pump pipe/discharge is not permitted), but not directly into a City storm sewer line, drain, inlet or box, a "Curb Cut Permit" must be obtained from the local jurisdiction. A City of Wichita licensed cement contractor must obtain such curb cut permit and pay the associated fee (set by the local jurisdiction). The contractor must submit a drawing or site plan with the request for the permit.
    - If a storm water drain pipe/discharge extends to and connects to a City storm line, drain, inlet or box, a Storm Sewer Permit, issued to a licensed drain layer or plumber, must be obtained from the local jurisdiction. In this circumstance, the local jurisdiction will obtain any required drawings for the permit review/issuance, and will route the permit application for reviews and approvals to the appropriate agencies, departments and/or divisions, and will also request/obtain a Compliance Certificate.

Because a Storm Sewer Permit must be obtained in this circumstance, local jurisdiction inspection staff will inspect the piping and connections for installation and code compliance.

If this connection to the storm water inlet is in public right-of-way, the contractor will be required to obtain a “Dirt or Pavement Cut” permit and pay the associated fee. If sidewalk or pavement is required to be removed during installation of pipe, a pavement cut permit is required to be obtained, and the City’s contractor will make the permanent repair with the costs being billed to the plumbing/sewer contractor.

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